REMARKS

Prior to entry of the present amendment, claims 1-38 were pending in the present application.

With regard to the Restriction Requirement outlined at pages 2-5 of the Office Action, the Applicant affirms the election of Group II, which includes claims 26-38. Claims 1-25 are canceled without traverse, and without prejudice to the filing of divisional or continuation applications.

As such, claims 26-38 are now pending in the present application. Claims 26, 32, 33, 34, 37, and 38 are amended above. No new matter is added by the claim amendment. Entry is respectfully requested.

The Applicants note that the Office Action Summary does not indicate whether the drawings filed in the application are acceptable. Confirmation of their acceptability is respectfully requested.

The Title of the Invention is objected to as not being descriptive. The applicants have amended the Title such that it is clearly indicative of the invention to which the claims are directed.

The Abstract of the disclosure is objected to for reasons stated in the Office Action at page 5. The Abstract is amended in a manner that is believed to overcome the objection. Entry of the amendments to the Abstract and removal of the objection are respectfully requested.

Claims 26-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elsawy, *et al.* (U.S. Patent No. 6,328,809 - hereinafter "Elsawy"). In view of the amendment to claim 26 and the following remarks, reconsideration and removal of the rejections, and allowance of the claims, are respectfully requested.

In the present invention as claimed in amended independent claim 26, a "first supply of drying fluid" is provided "at a first controlled rate of supply," and a "second supply of drying fluid" is provided "at a second controlled rate of supply." The "second controlled rate of supply" of the second supply of drying fluid" is "independent of the first controlled rate of supply of the first supply of drying fluid." A "supply of decontaminating fluid" is stored in a "decontaminating fluid tank." In addition, the "first supply of drying fluid" and a "combination of the second supply of drying fluid and decontaminating fluid" are simultaneously supplied to a "process chamber."

These features of the present invention are illustrated by way of example at least with reference to FIGs. 2-3 of the present specification. In this example, a first supply of drying fluid (2^{nd} N2) is provided from a first source 104B (see FIG. 3 of the present specification). The rate of flow of the first supply of drying fluid (2^{nd} N2) is controlled by a mass flow controller 182, such that the first supply of drying fluid (2^{nd} N2) is provided at a first controlled rate of supply (see FIG. 3 and page 8, lines 15-17). A second supply of drying fluid (1^{st} N2) is provided from a second source 104A (see FIG. 3 of the present specification). The rate of flow of the second supply of drying fluid (1^{st} N2) is controlled by a mass controller 183, such that the second supply of drying fluid (1^{st} N2) is provided at a second controlled rate of supply (see FIG. 3 and page 8, lines 11-13 of the present specification). In this manner, the second controlled rate of supply of the second supply of drying fluid (1^{st} N2) is independent of the first controlled rate of supply of the first supply of drying fluid (2^{nd} N2).

In addition, further to the above example, in a decontamination step, an IPA decontamination vapor is combined with the second supply of drying fluid (1^{st} N2) in an IPA tank 120 (see FIG. 3 and page 8, lines 27-28 of the present specification). At the same time, the first supply of drying fluid (2^{nd} N2) is simultaneously supplied with the combined second supply of drying fluid (1^{st} N2)/ IPA vapor to the process chamber 100 (see FIG. 3 and page 9, lines 7-15 of the present specification; see also FIG. 9, step 408). Following the decontamination step described herein, an optional drying step 410 can occur, wherein heated nitrogen vapor is sprayed

onto the wafers (see FIG. 9 and page 8, lines 1-2 of the present specification).

It is submitted that Elsawy fails to teach or suggest the present invention as claimed. In particular, Elsawy fails to teach or suggest "providing a first supply of drying fluid at a first controlled rate of supply," and "providing a second supply of drying fluid at a second controlled rate of supply," wherein the "second controlled rate of supply of the second supply of drying fluid" is "independent of the first controlled rate of supply of the first supply of drying fluid," as claimed in amended independent claim 26. Elsawy discloses a drying step that is performed on a wafer W by applying a heated N2 gas to an IPA vapor to carry the IPA vapor to a vessel 12 holding the wafer W (see Elsawy, FIG. 2 and column 5, lines 38-40). In this N2/IPA drying step, the N2 gas is provided by an N2 source 54, and heated by a heater 52, wherein the heated N2 gas flows into an IPA chamber that generates the IPA vapor (see Elsawy, FIG. 2, column 5, lines 45-46, and column 6, lines 11-17). In a second, separate, heated N2 drying step, valves 56, 59 are sealed to shut off the IPA flow, and a second output of N2 is provided by the N2 source 54, heated by the heater 52, and introduced into the vessel 12 via bypass valve 58 for the purpose of volatilizing condensed IPA remaining on the wafer (see Elsawy, FIG. 2 and column 5, lines 40-44). Thus, Elsawy teaches performing an N2/IPA drying step using a single supply of N2 as a carrier for the IPA vapor, followed by a separate, and subsequent, N2 drying step, in the same manner as that disclosed in the Background of the Invention section of the specification at page 1, line 25 - page 2, line 9, with reference to prior art FIG. 1. However, there is no mention in Elsawy of the N2 gas provided by an N2 source 54 in the N2/IPA drying step providing a "second controlled rate of supply of the second supply of drying fluid" that is "independent of the first controlled rate of supply of the first supply of drying fluid," as claimed in amended independent claim 26. In addition, while Elsawy also discloses a source of room temperature N2 66 (see Elsawy, FIG. 2), the room temperature N2 66 does not provide either the "first supply of drying fluid" or a "second supply of drying fluid," as claimed, since the source of room temperature N2 66 is introduced into the vessel 12 during a separate purging step to purge the system of air (see Elsawy, FIG. 2 and column 5, lines 60-62, and column 6, lines 34-36).

In addition, it is submitted that Elsawy fails to teach or suggest "simultaneously supplying the first supply of drying fluid and the combination of the second supply of drying fluid and decontaminating fluid to a process chamber...," as claimed in amended independent claim 26. Instead, the N2/IPA drying step and the heated N2 drying step are performed in separate steps, as explained above. There is no teaching or suggestion in Elsawy of the IPA vapor carried by the N2 gas in the N2/IPA drying step and the second output of N2 in the subsequent N2 drying step being "simultaneously" supplied to a "process chamber," as claimed.

The applicants note that the present invention teaches a unique approach to rinsing and drying semiconductor substrates, in that the "first supply of drying fluid" and the "combination of the second supply of drying fluid and the decontaminating fluid" are "simultaneously" supplied (emphasis added) to a process chamber. The present invention recognizes that the ratio of nitrogen gas to IPA gas in the process chamber is a critical factor during the IPA decontaminating step (see FIG. 9, step 408, and page 2, lines 10-12 of the present specification). In contrast, conventional approaches use nitrogen gas exclusively as a transport medium for the IPA gas during the decontaminating procedure (see page 2, lines 12-14 of the present specification). Elsawy teaches the conventional approach of using nitrogen gas as a transport medium, or carrier, for IPA vapor (see Elsawy, column 5, lines 37-39). Following this step, Elsawy teaches a conventional subsequent step of introducing heated N2 into the vessel to volatilize condensed IPA remaining on the wafers (see Elsawy, column 5, lines 39-42). This step is also disclosed in the Background of the Invention section of the present specification at page 2, lines 7-9. In contrast, as shown in FIG. 9, the present invention further teaches a subsequent step of drying the wafers using N2 vapor (see step 410) following the step of "simultaneously supplying the first supply of drying fluid and the combination of the second supply of drying fluid and decontaminating fluid to a process chamber," as claimed. In sum, there is no teaching or suggestion that the step of introducing heated N2 into the vessel to volatilize condensed IPA remaining on the wafers in Elsawy is "simultaneously" supplied with the "combination of the second supply of drying fluid and the decontaminating fluid."

In view of the above, it is submitted that Elsawy fails to teach or suggest the present invention set forth in amended independent claim 26. Reconsideration and removal of the rejections of independent claim 26, and dependent claims 27-38 thereon, under 35 U.S.C. 103(a) based on Elsawy are respectfully requested.

Closing Remarks

It is submitted that all claims are in condition for allowance, and such allowance is respectfully requested. If prosecution of the application can be expedited by a telephone conference, the Examiner is invited to call the undersigned at the number given below.

Respectfully submitted,

Date: December 1, 2005

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